

# The Effectiveness of Roads Policing

Technical Research for Thames Valley Police and Hampshire Constabulary



## Foreword

In 2013, 112 people were killed on the roads in Berkshire, Buckinghamshire, Oxfordshire, Hampshire and the Isle of Wight. Although this is a reduction of a third since 2008, Thames Valley Police and Hampshire Constabulary remain committed to further reducing the number of casualties resulting from road traffic collisions. At a time when financial cuts are being experienced in policing, it is more important than ever to ensure that roads policing activities are as effective as possible at reducing the numbers of road traffic collisions. The Joint Thames Valley and Hampshire Roads Policing Unit has therefore commissioned TRL to carry out innovative research into the links between roads policing activities and road traffic collisions. This is beginning to give a deeper insight into what the police should do to ensure that the number of road traffic casualties continues to fall.

**Joint Assistant Chief Constable Chris Shead**

Hampshire Constabulary and Thames Valley Police

## Contents

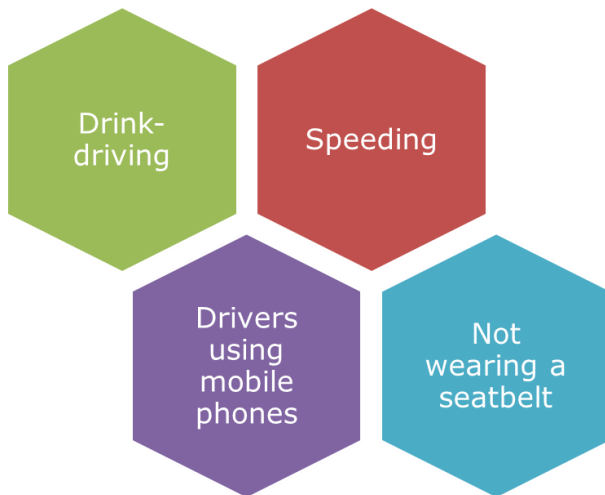
|               |    |
|---------------|----|
| Introduction  | 2  |
| Speed         | 5  |
| Seat belts    | 7  |
| Drink-driving | 9  |
| Mobile phones | 11 |
| Summary       | 13 |

## Introduction

The Joint Thames Valley and Hampshire Roads Policing Unit is committed to reducing casualties and making the roads safer through evidence-led policing.

This report summarises an independent review of the local area and the findings and recommendations that resulted to help the Roads Policing Unit to achieve their commitment.

**The Fatal Four are a priority for the Unit:**



Concentrating on the Fatal Four, experts at TRL have carried out a detailed literature review, in-depth review and analysis of police offence and collision data, and carried out a series of compliance surveys.

This research has resulted in a series of recommendations and estimates of the numbers of lives that could be saved with increased enforcement.



## Evidence-led policing

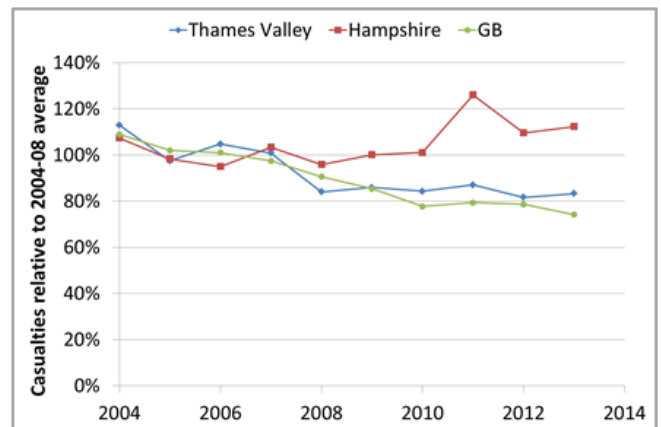
TRL has worked with the Joint Roads Policing Unit to ensure that their approach to enforcement is efficient and effective at reducing the number of casualties killed and seriously injured on the roads in Hampshire and the Thames Valley.

# The Effectiveness of Roads Policing

## Casualties

There were 112 people killed on the roads in Thames Valley and Hampshire in 2013, representing 7% of all of those killed on the roads in Great Britain. In addition 1,848 people were seriously injured.

Approximately 19% of road casualties were in collisions in which there was a contributory factor indicating an illegal action, the major factors being impaired by alcohol and exceeding the speed limit.

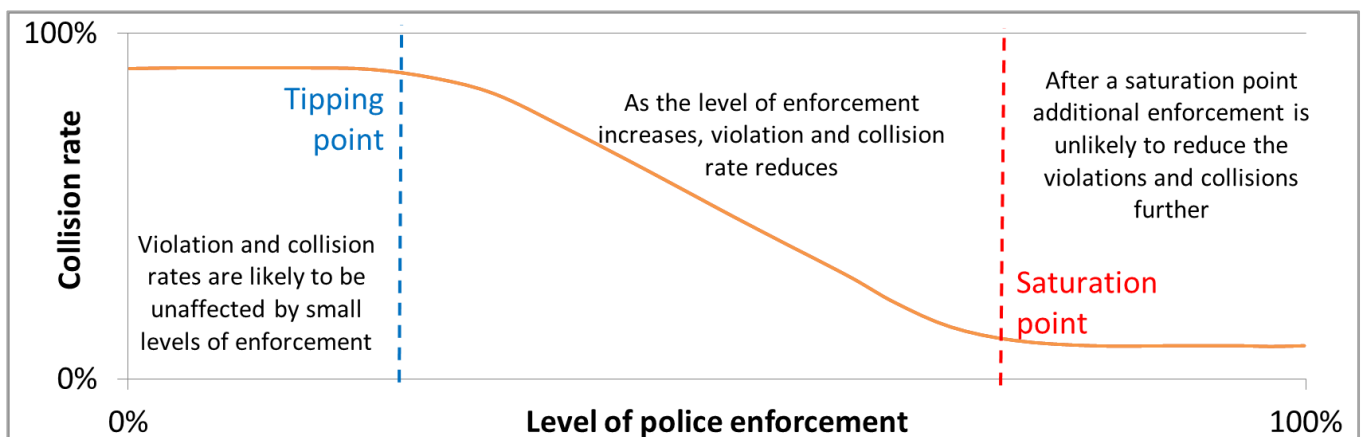


**Thames Valley:** KSI casualties have reduced between 2004 and 2013; a similar trend to GB as a whole.

**Hampshire:** KSI casualties have increased over the past few years.

## Collisions and Enforcement

The theoretical relationship between enforcement and collisions suggests that:



(Ref: Walter et al., 2011)

## General recommendations

- Randomisation of locations and times of enforcement should be used to increase the perceived risk of detection.
- For future evidence based policy decisions, police should consider recording enforcement activities, in terms of hours of enforcement carried out, and their locations. This gap in the data resulted in limitations in the analysis that could be carried out.
- Appropriate media and educational campaigns should be considered alongside any enforcement strategies to ensure the biggest and farthest reaching effects.



# The Effectiveness of Roads Policing

## Roads Policing strategies

Increased levels of roads policing can reduce traffic violations and road casualties. Multiple approaches are required.

**General enforcement:** targeted at the driving public as a whole

- Achieved by increasing the perceived risk of detection and certainty of punishment.
- Highly visible policing methods coupled with appropriate publicity campaigns.



**Specific enforcement:** targeted at a minority of high-risk offenders

- Achieved through covert, mobile, enforcement methods.

| Recommended targeting | Drink-driving      | Speeding                     | Mobile phone  | Seat belts                                      |
|-----------------------|--------------------|------------------------------|---------------|---|
| Who                   | Young males        | 17-30 years                  | Young males   | Young males<br>Children<br>Rear seat passengers |
| Vehicle types         | Cars               | Motorcyclists<br>Car drivers | Vans<br>Taxis | Vans<br>Taxis                                   |
| Days                  | Weekends           | Weekends                     | Weekdays      |   |
| Times                 | Evenings<br>Nights | Evenings                     | Daytime       |   |

## Recommendations

- Traffic policing should continue throughout the day and night
  - Traffic offences are committed and result in serious injuries and fatalities throughout the day. Redeployment of traffic officers to incidents off the road network have a direct impact on driving offences, traffic collisions and fatalities which continue to occur.
- Both general and specific enforcement should be used
  - The split between the two depends on types of offenders in the region; whether offenders are generally repeat offenders or individuals with no previous offence history.
  - Marked and stationary policing should be used for general deterrence and unmarked policing should be used for specific deterrence.
- Road users, times and locations should be targeted based on the table above.

## Speed

Exceeding the speed limit is a high risk activity for the driver of a vehicle, other occupants of the vehicle and other road users who may become involved in a collision with a driver exceeding the speed limit.

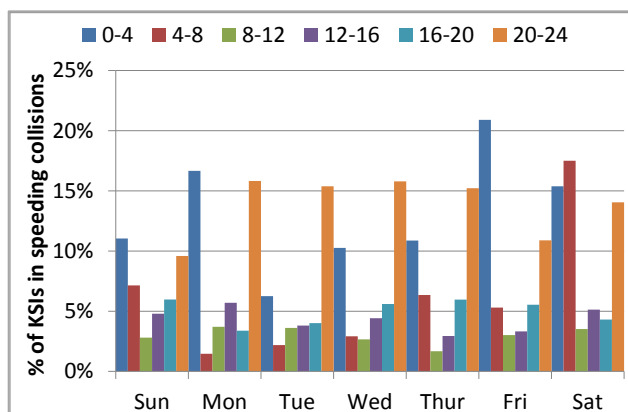


## Casualties

Between 2008 and 2012 7% of KSI casualties in the Thames Valley and Hampshire were in collisions where contributory factor 306 'exceeding speed limit' was recorded. The proportion of collisions involving speed as a contributory factor reduced over this period.

Collisions involving excessive speed are of higher severity; 15% of fatalities in the region were in speeding collisions compared with 6% for seriously injured casualties.

The incidence of speeding amongst KSI casualties varied throughout the week as shown below, with peaks in the evenings, overnight and at weekends.



## Literature evidence

**Speed cameras are effective at reducing speed offences and casualties.**

Fixed speed cameras are better than mobile cameras for collision reduction, and mobile cameras are better for specific deterrence.

Fixed cameras are very effective at enforcement at the sites where they operate. However, they have a limited 'halo' effect; that is, the time and distance around them for which speeds are reduced. Research showed that halos are nine weeks and five times larger for manned enforcement than fixed cameras.

Mobile cameras are also effective, and help to enforce the camera sites. These should be used to target specific locations, times or types of drivers based on evidence.

# The Effectiveness of Roads Policing

## Offences

The vast majority of Fixed Penalty Notices (FPNs) for speeding were issued for exceeding 30mph, with about half of these at fixed camera sites.

The highest numbers of speeding FPNs were issued between Tuesday and Thursday, with fewest at the weekend.

Fixed camera sites had fewer offences per enforcement day compared with mobile and attended sites, suggesting that the fixed camera sites are an effective deterrent and that targeting of attended sites is good.

## Compliance

Speed data for a sample of sites showed that the average speed was below the posted speed limit, whilst the 85<sup>th</sup> percentile speeds were just above the speed limit.

The average speeds were highest between 8pm and 6am, when traffic levels are likely to be lower.

Based on a small number of sites the potential savings in fatalities if all drivers/riders were compliant with the speed limit is considerable for low speed sites.

| Site type | Potential fatality saving |
|-----------|---------------------------|
| 30mph     | 37%                       |
| 40mph     | 7-12%                     |
| 60mph     | 2-4%                      |

## Recommendations

- Use of automatic cameras is effective and should be continued.
- Fixed automatic cameras are a deterrent for general offenders and further fixed automatic camera locations and average speed cameras should be considered where a particular speeding issue exists.
- Use manned mobile camera sites to target high-risk offenders at high-risk locations at evenings and weekends.
- The halo effect of manned speed enforcement is considerably larger than at unmanned camera sites and this should be considered when deciding on the method of enforcement.
- Speeding and speeding collisions can also be reduced using appropriate engineering measures, carried out by the local highway authority. For example, traffic calming and changing speed limits where appropriate. Most drivers will remain within a speed limit if there is a clear reason for this limit.

## Seat belts

Seat belts are a secondary safety measure designed to reduce the severity of vehicle occupants in collisions. A driver's decision whether to use a seat belt or not has some influence on the decision of other occupants of their vehicle.

### Casualties

The use of seat belts is not recorded well in the Stats19 collision data.

In-depth collision data (Richards et al, 2008) showed that 23% of KSI car occupants were not wearing their seat belt, demonstrating that wearing a seat belt reduces the chance of a severe injury.

There was a higher level of non-compliance in collisions involving cars amongst the following groups:

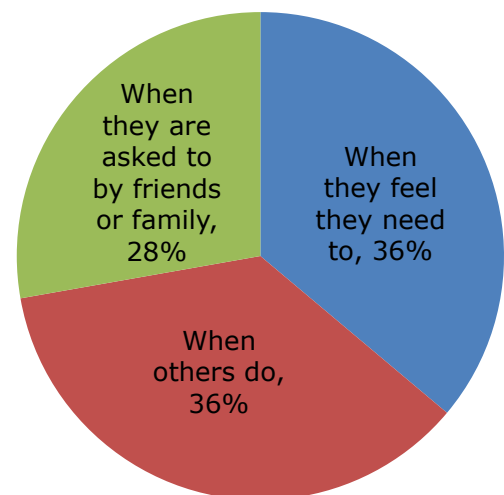
- Aged 16 – 29
- Males
- Rear seat passengers
- Car-derived vans
- Older vehicles
- Collisions between midnight and 4am

### Literature

**With high wearing rates, there is limited evidence on the effect of enforcement on increasing compliance.**

There is some evidence that combining enforcement and publicity results in increased compliance of seat belt wearing, which may continue after the campaign has ended. Campaigns should be intensive, highly visible and well-publicised.

A survey (Christmas et al, 2008) showed that inconsistent seat belt wearers represented approximately 1 in 7 of the population and fell into three groups:



The 'When they feel they need to' group, (for example, when there are police around, when driving with children or when on motorways) group is associated with the highest crash risk, and so enforcement activities which increase seat belt wearing in these people may result in the greatest casualty savings.



# The Effectiveness of Roads Policing

## Offences

The proportion of offences which were seat belt offences varied substantially across the year, being almost twice as high in March as in December.

The majority of FPNs were issued between 8am and 8pm with the highest numbers issued between 8am and midday.



## Compliance

An observational survey showed wearing rates were:

- 98% for car drivers
- 95% for front seat car passengers
- 80% for rear seat car passengers
- Lowest for young occupants
- Lower for van and taxi occupants

The potential annual casualty savings if everyone wore their seat belt is estimated as:

| Injury severity | Annual casualty reduction |     |
|-----------------|---------------------------|-----|
| Killed          | 9                         | 15% |
| Serious         | 57                        | 8%  |
| Slight          | 137                       | 2%  |

## Recommendations

- Enforcement of seat belt wearing rates **should not be a focus for police enforcement** as:
  - seat belt wearing rates are high and have been at a steady level for car front seat occupants for many years
  - the impact of police enforcement on the level of seat belt compliance is unknown
  - seat belt reminders in vehicles may help increase seat belt wearing rates without police intervention.
- If police effort is continued in this area, primary enforcement which identifies and stops vehicles with non seat belt wearing occupants is more effective than secondary enforcement where the vehicle is stopped for another offence.
- Enforcement, if used, should also continue throughout the day and target younger, male drivers and their passengers.
- Either alone, or in combination with enforcement, highly visible and communicated campaigns may help increase compliance. Working with stakeholders to publicise use of seat belts and child restraints could be an efficient use of police time.
- For the purposes of being an evidence-based police force, officers should make every attempt to complete the use of the seat belt field in the Stats19 collision data.

## Drink-driving

Drink-driving is a high-risk activity, with the risk increasing exponentially with higher alcohol levels. Drivers have 11 times greater risk of dying in a collision with an alcohol level at the legal limit (80mg/100ml).

Drink-drive accidents will not only affect the drink-driver, but other vehicle occupants and road users.



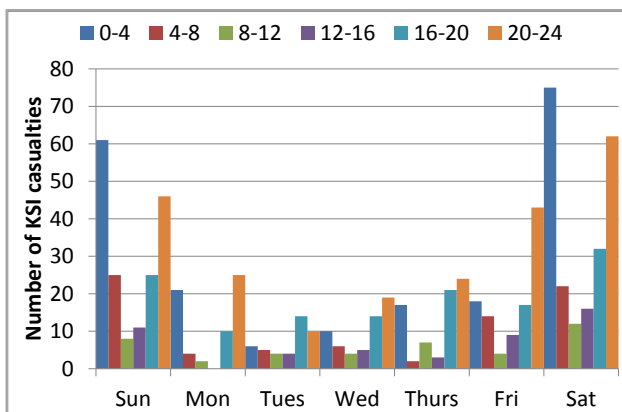
### Casualties

8.5% of KSI casualties and 14% of fatalities in the Thames Valley and Hampshire were in collisions where alcohol impairment was a factor.

Breath tests were failed by 2.9% of all drivers/riders in collisions and 7.5% of seriously injured drivers/riders.

There is a high incidence of alcohol-impairment:

- At night
- At weekends



- Amongst younger males
- In rural locations

### Literature evidence

**There is good evidence relating enforcement of drink-driving to reduced violations and collisions.**

Both random and selective breath testing are good for specific and general deterrence. Mobile sites are most effective for specific and fixed locations for more general, overt deterrence.

Systematic testing of all drivers is most efficient and has been shown to reduce fatal collisions by 26%.

Randomised breath testing showed larger reductions, but is currently not permitted in Britain. However, randomisation of time and location is also effective; in particular, rural areas where there are a few routes to a drinking establishment, and early evening campaigns, so that the police are highly visible for drivers on their way out is also effective.

# The Effectiveness of Roads Policing

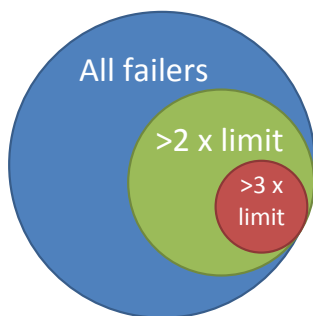
## Offences

Police carry out breath tests following a collision or moving traffic offence, or because the officer suspects use of alcohol. Overall 1 in 7 tests were failed or refused.

More breath tests were taken between 8pm and 4am and at weekends, with a higher failure rate, suggesting that current targeting is effective.

December had the largest number of breath tests undertaken, due to the December drink-drive campaign. Despite the increased number of tests, the number of failures was similar to other months, giving an overall lower failure rate.

The alcohol levels from breath tests were:



## Compliance

Collision and risk data were used to estimate that the non-compliance level is between 0.3% and 0.7%, with approximately seven times this level of non-compliance between midnight and 4am.

The estimated compliance level and the collision risk for drink-driving was used to estimate the potential casualty savings if drink-driving were eliminated.

The annual estimate reductions were:

| Casualty severity | Reduction in annual casualties |          |
|-------------------|--------------------------------|----------|
| Fatality          | 31                             | 24%      |
| KSI               | 132-161                        | 6.8-8.4% |

## Recommendations

- The levels of current policing activity should not be stopped but could be more effective with higher priority given to evening and weekend activity.
- Locations should be randomised, but in high risk evidence-led locations, for example, near to drinking establishments.
- Specific deterrence is needed for high risk offenders, whilst general deterrence is required for low risk or lapsers.
- Drink-drive rehabilitation courses are effective and should continue to be used.
- To ensure robust evidence based analysis, increase the reporting of breath test data in the Stats19 collision reporting form.

## Mobile phones

Using a mobile phone whilst driving increases the risk of a collision by a factor of four, and driving ability is reduced to something similar to that observed for drivers at the legal alcohol limit.

### Casualties

Collisions involving drivers using mobile phones also endangers other occupants of their vehicle and other road users.

Stats19 data showed that 0.6% of KSI casualties were in collisions where 'driver using mobile phone' was a contributory factor. This includes 50 casualties who were killed or seriously injured over five years.

This factor is likely to be under-reported since, in many cases, it will be unknown and only a full investigation involving examination of phone data would determine whether this was the case.

The in-depth accident data suggested a higher rate of 4% of fatal collisions involved at least one driver using a mobile phone.



### Literature evidence

**There is limited evidence linking the effectiveness of enforcement on using mobile phones while driving.**

There was no evidence for the impact of education, training or penalties. Covert enforcement plus routine vehicle checks were shown to increase compliance.

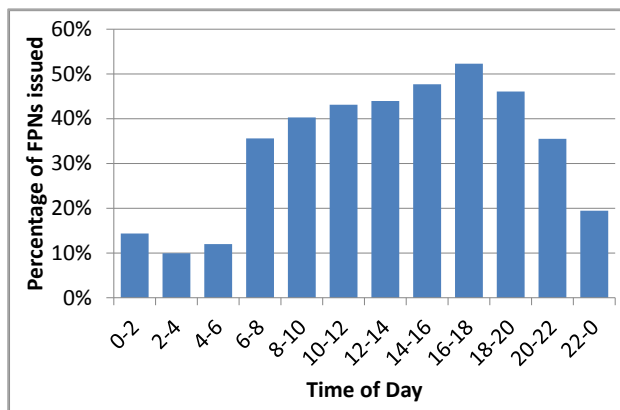


# The Effectiveness of Roads Policing

## Offences

The use of a hand-held mobile phone while driving is a criminal offence and is endorsable. Using a hands-free mobile phone is currently legal, although research has shown that this has a similar risk of collision to a hand-held device.

The majority of mobile phone offences were recorded between 8am and 8pm, although this is likely to be when more enforcement is carried out. The proportion of FPNs that were for mobile phone offences was highest between 4pm and 6pm.



There were higher numbers and percentage of mobile phone offences on weekdays. These results suggest a daytime and work hours issue, although the amount of resource used for enforcement is unknown.

## Compliance

An observation survey showed that

- Hands-free and hand-held phone use had increased since 2008
- 3.6% of car drivers were using a hand-held mobile phone
- 4.5% of car drivers were using a hands-free phone
- Males and young drivers were more likely to be using a mobile phone
- Hand-held phone use was similar across all vehicle types

If all hand-held phone use was eliminated, and hands-free use remained at the current level, the annual number of car driver fatalities is estimated to reduce by 11%.

| Road user        | Potential fatality saving |
|------------------|---------------------------|
| Car driver       | 8                         |
| Other casualties | 9                         |

## Recommendations

- Enforcement can only be used for hand-held use as hands-free devices are currently not illegal. However, publicity campaigns and education by officers need to highlight the dangers of both hand-held and hands-free phones, since the collision risk is similar.
- Enforcement should be targeted on weekdays during working hours.
- Campaigns could be focussed towards employers and work-related road safety. This could include encouraging drivers not to use a phone whilst driving (hands-free and hand-held) and to check whether a respondent is safe to talk when making a call.

## Summary

The Joint Roads Policing Unit of Thames Valley Police and Hampshire Constabulary commissioned the technical research summarised here to evaluate the effectiveness of their policing strategy.

The research combined a literature review with analyses of offence and casualty and compliance surveys, and has resulted in a series of recommendations aimed at improving the efficiency and effectiveness of their current strategy.

Non-compliance was highest for the use of child restraints (13%), followed by restraint use for all vehicle occupants, and lowest for drink-driving. However, the impact of these various illegal actions varies.

Based on these compliance levels, the table shows the potential casualty savings if compliance for each of these offences were increased to full compliance is highest for mobile phone use and drink-driving.

| Measure               |  | Non-compliance | Annual KSI reduction    |       |
|-----------------------|--|----------------|-------------------------|-------|
| Mobile phone use      | Hand-held                                | 3.6%           | 242 (in car collisions) | 11%   |
|                       | Hands-free <sup>1</sup>                  | 5.8%           | -                       | -     |
| Restraints            | All car, van, taxi drivers and occupants | 6.4%           | 66 (car occupants only) | 8-15% |
|                       | Car driver                               | 1.9%           | -                       | -     |
|                       | Child restraints                         | 13.1%          | -                       | -     |
| Drink-driving         | Drivers/riders above legal limit         | 0.3%-0.7%      | 161                     | 7-24% |
| Speeding <sup>2</sup> | 30mph                                    | 9.7%           | -                       | -     |
|                       | 40mph                                    | 1.7%-2.7%      | -                       | -     |
|                       | 60mph                                    | 0.5%-0.9%      | -                       | -     |

<sup>1</sup> The use of hands-free phones is not illegal <sup>2</sup> Based on a very small number of sites



# The Effectiveness of Roads Policing



## References

Christmas, S., Young, D. and Cuerden, R. (2008). Road Safety Research Report 98. Strapping Yarns: Why People Do and Do Not Wear Seat Belts. Department for Transport, DfT: London, UK.

Richards, D.C., Hutchins, R., Cookson, R.E., Massie, P. and Cuerden, R.W. (2008). Who doesn't wear seat belts? In Proceedings of the 3rd International Expert Symposium on Accident Research (ESAR), 2008.

Walter, L., Broughton, J., and Knowles, J. (2011). The effects of increased police enforcement along a route in London. Accident Analysis and Prevention, 43 (3), 1219-1227.

## Technical Report

The full report describing all the detail of the research in this summary can be downloaded from the TRL website:

**L Smith, B Lawton, G Beard, L Durrell, J Scoons and L Lloyd (2015).** The effectiveness of roads policing strategies. TRL Published Project Report PPR731, Wokingham

# The Effectiveness of Roads Policing

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